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E7.3 106.1.0  
CR-132007

## MONTHLY PLANS AND PROGRESS REPORT

Title: Evaluation of Usefulness of Skylab EREP S-190 and S-192 Imagery in Multistage Forest Surveys

Period Covered: April 1, 1973 to May 31, 1973

Contract: NAS 9-13289  
EREK Investigation #483

EarthSat  
Project No: G-091

Principal  
Investigator: Mr. Philip G. Langley

## OVERALL STATUS

During this reporting period we have continued to make progress towards our overall objectives, mainly in terms of our effort to develop the software for use in machine-oriented digital interpretation of space platform imagery.

As can be seen in our milestone plan, the effort for this particular subtask will last through December and we estimate that at the moment we have realized approximately 30% of the software development for this digital analysis task. We are now performing the trial interpretations of space platform imagery to obtain a first impression of the interpretation system performance.

We have followed the events of the Skylab missions as they have unfolded so far with great interest. We expect the first data over our test site to be acquired June 3rd. The new track (60 miles west of the previously advertised track) will give us slightly better coverage of the Lake Tahoe part of our test site but, on the other hand, a significant

E73-10610) EVALUATION OF USEFULNESS OF  
SKYLAB EREP S-190 AND S-192 IMAGERY IN  
MULTISTAGE FOREST SURVEYS Progress  
Report, 1 Apr. - (Earth Satellite Corp.,  
Berkeley, Calif.) 5 p HC \$3.00 CSCL 02F

N73-24371

Unclas  
G3/13 00610

portion of the northern part of the site will lack S-192 coverage. On balance, therefore, we would prefer the previously advertised track for the SL/3 mission.

#### EXPECTED ACCOMPLISHMENTS FOR NEXT REPORTING PERIOD

For the coming reporting period we anticipate to continue our present digital interpretation work. We will start to subject interpretation results to more rigid tests, to discover possible correlations of interpretation results and timber volume distribution. In addition, we will keep ourselves informed as to the status of the data acquisition over our test sites.

#### SIGNIFICANT RESULTS FOR THIS PERIOD

We have developed a set of digital interpretation programs which perform the following tasks: (1) extraction of images for a desired sample unit or combination of sample units by scanner channel and storage of these images on a high-speed storage device; (2) extraction of tone and texture information of 8 x 8 pixel interpretation units by channel and storage of these features on a high-speed storage device; (3) "center of gravity" cluster node seeking in higher dimensional space and subsequent nearest neighbor classification, and output of the classification results on a high-speed storage device. In all instances can we relate the classification results to the original place of subset extraction through the coordinate transformation work performed under Task II of our project.

## SUMMARY OUTLOOK FOR REMAINING EFFORT TO BE PERFORMED

We will continue to develop our software capability for digital analysis over the next several months. We expect to receive the first imagery in July. We will then perform a "first look" analysis of the space and aircraft imagery using multi-spectral combining equipment. During this period we will decide where in our test site the primary concentration for the forest inventory effort will be made. This decision will guide the sample unit and boundary annotation work on both the EREP and aircraft support imagery.

We do not expect to receive the S-192 tapes before August. A LARS system analysis of these tapes will be made at our Washington, D.C. facility. As a result of this analysis we will obtain an idea, among other information, of the desirable channels to be used in our forestry oriented interpretation system.

A detailed time schedule by subtasks is indicated in the enclosed milestone plan.

## TRAVEL PLANS

None for the next reporting period.

SKYLAB EREP INVESTIGATION 473  
MILESTONE PLAN

| Sub-tasks  | Proposal Task | Phase I<br>(Pre-Mission) |     | Phase II<br>(Mission and First Look) |      |      | Phase III (Post Mission) |      |     |     |     |     |     |     |     |
|--|---------------|--------------------------|-----|--------------------------------------|------|------|--------------------------|------|-----|-----|-----|-----|-----|-----|-----|
|  |               | Mar                      | Apr | May                                  | June | July | Aug                      | Sept | Oct | Nov | Dec | Jan | Feb | Mar | Apr |
| 1. Coordinate transform program preparation and testing                                    | II            |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |
| 2. Digital interpretation program preparation and testing                                  | III           |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |
| 3. Developing of sampling techniques   | I             |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |
| 4. "First Look" analysis of SL/2 EREP images   |               |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |
| 5. "First Look" analysis of RB-57 photographs  |               |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |
| 6. Multi-spectral combining of images  |               |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |
| 7. Automated interpretation of S-192 tapes with the LARS system                            | III           |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |
| 8. Use of coordinate transform programs to transfer sample units to RB-57 and EREP imagery | II            |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |
| 9. Manual image interpretation   | I             |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |
| 10. Digital image interpretation   | III           |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |
| 11. Computation of volume estimates  |               |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |
| 12. Evaluation of interpretation techniques  |               |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |
| 13. Final report writing   |               |                          |     |                                      |      |      |                          |      |     |     |     |     |     |     |     |

Note: The premission, mission and first-look, and post mission phases, correspond to the phases used in the cost and manpower definition statement submitted with the letter forwarding the Statement of Work.